19 April 1963

Dear John,

During the last week we have gotten some more information. This is summarized in the attached graph.

Curve 1 is the transfer function required of any viewing system or enlarger to make the best images obtained by our system just detectable. When the weather is not good, or the atmosphere is turbulent, or the object on the ground is not high contrast, then a higher transfer function is required.

Curve 2 is the very best measured performance of the 40X enlarging capability of the 10-20-40X enlarger. That enlarger is only as good as this curve in one orientation. The other magnifications are not as good as this. You will note that the use of that enlarger means that all information above 120 cyc/mm is lost under the best conditions. Under less than the best conditions even more information is lost.

Curve 3 is the same kind of curve as Curve 2, but is for the Turn-Around-Printer. This curve is based on incomplete information, but I do not believe that the actual curve will be very much different than this curve. In this case all information beyond 160 cyc/mm is completely lost.

Curve 4 represents a desirable objective which would be theoretically achievable with an f/1 diffraction limited lens. This is the kind of thing you can achieve with microscopic sized optics, but it is completely impractical for a reasonable size film chip.

Curve 5 shows the theoretical limit which can be achieved when coherent light is used instead of incoherent light. We believe that this is the correct approach to the problem.

Curve 6 represents what we believe is a reasonable design objective for a coherent light enlarger. In this case, information above 190 cyc/mm is still lost, but this performance is still significantly better than that shown by Curves 2 and 3.

We have discussed this with both [redacted] STAT who visited here this week, and we look forward to discussing this in more detail with you.

Best regards

Milt

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Enclosure